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EXAMINER

BERNATZ, KEVIN M

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 03/03/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,767

Applicant(s)

MAEDA ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 6 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Examiner's Comments

1. The examiner notes that the residual magnetization (B_r) is proportional to $4\pi M_s$, where M_s is the saturation magnetization. The examiner further notes that B_r is proportional to B_s (though not identical – see pertinent prior art cited below).

Claim Objections

2. Claim 6 is objected to because of improper Markush language. The proper language is either "...selected from a group consisting of A, B, C and D." or "...is A, B, C or D." See MPEP § 2173.05(h).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (IEEE Trans. Mag., 33(5), 1997, 2983 – 2985).

Regarding claims 1 and 7, Ando et al. disclose a magnetic recording medium comprising and in-plane magnetic film (*Figure 1 – pinning layer and Abstract*) having a magnetization easy axis in an in-plane direction; and a perpendicular magnetic film

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formed on said in-plane magnetic film (*Figure 1 – perpendicular layer and Abstract*) the perpendicular magnetic film having a magnetization easy axis oriented in a direction perpendicular to said magnetization easy axis of said in-plane magnetic film (*i.e. as shown in Figure 1*).

The limitation(s) "used for recording" is (an) intended use/functional limitation(s) and is not further limiting in so far as the structure of the product is concerned. "[I]n apparatus, article, and composition claims, intended use must result in a **structural difference** between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. **If the prior art structure is capable of performing the intended use, then it meets the claim.** In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art." [emphasis added] *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); *In re Otto*, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963). See MPEP § 2111.02. In the instant case, the in-plane layer is still a magnetic layer and therefor is capable of being used for recording.

In the instant case, since B_r is proportional to B_s and $4\pi M_s$, the examiner deems that Ando et al. necessarily disclose the claimed relationship since the perpendicular layer will have a tB_r starting around $30 \text{ nm} \times 280 \text{ emu/cm}^3$ (8400) and the in-plane layer will have a value at least 5 times greater ($750 \text{ G} \times 150 \text{ nm} = 112,500 = 13.4$ times greater than 8400). Applicants' are respectfully requested to provide a declaration stating the relationships between B_r , B_s and M_s if they deem the examiner's estimates to be in error.

It would therefor have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the tBr value through routine experimentation, since the values would have been necessarily present given the Bs and Ms values taught by Ando et al. and the range in thickness disclosed by Ando et al. for the perpendicular magnetic layer. *In re Boesch*, 205 USPQ 215 (CCPA 1980), *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Regarding claim 3, it has been held that where claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a *prima facie* case of either anticipation or obviousness has been established and the burden of proof is shifted to applicant to show that prior art products do not necessarily or inherently possess characteristics of claimed products where the rejection is based on inherency under 35 USC 102 or on *prima facie* obviousness under 35 USC 103, jointly or alternatively. Therefore, the *prime facie* case can be rebutted by **evidence** showing that the prior art products do not necessarily possess the characteristics of the claimed product. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Since the perpendicular magnetic film is disclosed to possess a Hk of 6-7 kOe and a Hc of 1700 – 3000 Oe, while the Hc of the in-plane magnetic film is only 200 – 300 Oe (*Figure 1*). Given the large difference in Hc values, the examiner deems there

is sound basis for believing the prior art would necessarily possess Hk values meeting applicants' claimed limitations. Therefore, in addition to the above disclosed limitations, the presently claimed property of relative Hk values would have necessarily been present because the prior art has a large difference in Hc values, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Regarding claim 6, CoCrTa is a Co-alloy magnetic film (*Figure 1*).

5. Claims 1 – 3, 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Futamoto et al. (U.S. Patent Application Publication 2003/0022025 A1).

Regarding claims 1 and 7, Futamoto et al. disclose a magnetic recording medium comprising and in-plane magnetic film (*Figure 8 – element 72; Paragraphs 0018, 0037, 0092, 0093 and Table 3*) having a magnetization easy axis in an in-plane direction; and a perpendicular magnetic film formed on said in-plane magnetic film (*Figure 8 – element 71*) the perpendicular magnetic film having a magnetization easy axis oriented in a direction perpendicular to said magnetization easy axis of said in-plane magnetic film.

The limitation(s) “used for recording” is (an) intended use/functional limitation(s) and is not further limiting in so far as the structure of the product is concerned for the reasons cited above.

In the instant case, the structure of the claimed and prior art products are substantially identical (in-plane magnetic film disposed adjacent to a Co-alloy perpendicular magnetic film).

Therefore, in addition to the above disclosed limitations, the presently claimed property of the relative tBr values would have necessarily been present in the disclosed embodiment comprising the NiCr in-plane film and the CoCrPt perpendicular film because the prior art structure is substantially identical to applicants' claimed structure, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Regarding claim 2, Futamoto et al. disclose thickness values meeting applicants' claimed limitations (*Paragraphs 0039 and 0045*).

Regarding claim 3, the claimed Hk relationship would necessarily been present in the disclosed embodiment cited above for the reasons of record.

Regarding claim 6, Futamoto et al. disclose alloys meeting applicants' claimed limitations (*Paragraphs 0042, 0043 and examples*).

6. Claims 1 and 3 - 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawato et al. (U.S. Patent Application 2002/0028356 A1).

Regarding claims 1 and 7, Kawato et al. disclose a magnetic recording medium comprising an in-plane magnetic film (*Figures 5A, 6A and 10 – element 105; and Paragraphs 0042, 0044 and 0045*) having a magnetization easy axis in an in-plane direction; and a perpendicular magnetic film formed on said in-plane magnetic film (*Figure 10 – element 107*) the perpendicular magnetic film having a magnetization easy axis oriented in a direction perpendicular to said magnetization easy axis of said in-plane magnetic film.

The limitation(s) "used for recording" is (an) intended use/functional limitation(s) and is not further limiting in so far as the structure of the product is concerned for the reasons cited above.

In the instant case, the structure of the claimed and prior art products are substantially identical (in-plane magnetic film disposed adjacent to a Co-alloy perpendicular magnetic film).

Therefore, in addition to the above disclosed limitations, the presently claimed property of the relative tBr values would have necessarily been present in the disclosed embodiment represented by Figure 10 comprising the CoZrTa in-plane film and the CoCrPtB perpendicular film because the prior art structure is substantially identical to applicants' claimed structure, and there is no evidence currently of record showing that the disclosed prior art products do not necessarily possess the characteristics of the claimed product.

Regarding claim 3, the claimed Hk relationship would necessarily been present in the disclosed embodiment cited above for the reasons of record.

Regarding claims 4 and 5, Kawato et al. disclose spacer layers meeting applicants' claimed limitations (*Figure 10 – element 106 and Paragraph 0044*).

Regarding claim 6, Kawato et al. disclose alloys meeting applicants' claimed limitations (*Paragraphs 0028 and 0044*).

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Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. ISU Ceramics document (http://www.isu.co.kr/ceramics/eng/prod_03) disclose relationship between Bs and Br (Figure 1). Nasu et al. (U.S. Patent No. 5,326,637) and Kurokawa et al. (IEEE Trans. Mag., 32(5), 1996, 3810-3812) provide general background on composite recording media with both in-plane and perpendicular layers.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (703) 308-1737. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (703) 308-2367. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.



KMB
February 15, 2003



Paul Thibodeau
Supervisory Patent Examiner
Technology Center 1700